

REMARKS

Claims 1-9, 11, 12, 14-20, and 31-36 were pending. Claims 31 and 32 have been canceled. Claims 1, 3, 6, 12, 14, 35, and 36 have been amended. Claims 37 and 38 have been added. Claims 1-9, 11, 12, 14-20, and 33-38 are pending.

Claims 1-9, 11, 12, 14-20, and 31-36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over applicant's admitted prior art (APA) in combination with U.S. Pat. Appl. No. 2002/0062923 to Forray and U.S. Pat. No. 5,583,378 to Marrs et al. Applicant respectfully traverses the rejection.

The present invention as recited in amended claim 1 is a semiconductor device assembly including "a solder mask over a substrate," "a die," "conductive paths connecting contacts on said die with contacts in said substrate," and "a partially-cured adhesive layer adhering said die to said solder mask." The partially-cured adhesive layer has been "partially cured at a temperature below about 100°C," and has "adhesive strength sufficient to hold said die to said solder mask during subsequent package assembly processing."

The APA does not disclose a device having a partially-cured adhesive layer as part of its structure, as the Examiner recognizes on page 2 of the Office action.

Forray does not cure the deficiencies of the APA. Forray generally discusses devices having reduced void formation, but does not teach or suggest a semiconductor device assembly including "a solder mask over a substrate," "a die," "conductive paths connecting contacts on said die with contacts in said substrate," and "a partially-cured adhesive layer adhering said die to said solder mask." Further, Forray does not teach or suggest such a device having a partially-cured adhesive layer that has been "partially cured at a temperature below about 100°C," and has "adhesive strength sufficient to hold said die to said solder mask during subsequent package assembly processing."

Marrs et al. does not cure the deficiencies of APA and Forray. Marrs et al. has been cited as evidence that encapsulants are well known in the art. Marrs et al. discloses adhering a heat sink to a chip, but does not provide the missing teachings of “conductive paths connecting contacts on said die with contacts in said substrate” with “a partially-cured adhesive layer adhering said die to said solder mask,” the partially-cured adhesive layer having been “partially cured at a temperature below about 100°C” and having “adhesive strength sufficient to hold said die to said solder mask during subsequent package assembly processing.”

Claim 1, and its dependent claims 2-9, 11, 33, 34, and 37, are submitted as patentable over the cited references to APA, Forray, and Marrs et al.

The present invention as recited in amended claim 12 is a semiconductor device assembly including “a solder mask on a substrate,” “a die,” “electrical contacts on said substrate and said die,” “each said contact on said die being connected to a respective said contact on said substrate, said electrical contacts being devoid of contamination caused by outgassing from said solder mask,” and “a partially-cured adhesive layer affixing said die to said solder mask.” The partially-cured adhesive layer contains adhesive “partially cured at a temperature below about 100°C and at a temperature between about 20°C and about 50°C higher than a glassy temperature of said adhesive layer,” the partially-cured adhesive layer “having adhesive strength sufficient to hold said die to said solder mask during subsequent package assembly processing.”

Applicant notes above that APA, Forray, and Marrs et al. do not teach or suggest an device with “a solder mask on a substrate,” “a die,” “electrical contacts on said substrate and said die,” “each said contact on said die being connected to a respective said contact on said substrate,” and “a partially-cured adhesive layer affixing said die to said solder mask,” the partially-cured adhesive layer “having adhesive strength sufficient to hold said die to said solder mask during subsequent package assembly processing.” Further, none of the cited references to APA, Forray, and Marrs et al. discloses that the partially-cured adhesive layer contains adhesive “partially cured at a temperature below about 100°C

and at a temperature between about 20°C and about 50°C higher than a glassy temperature of said adhesive layer.” Independent claim 12 recites an assembly having a partially-cured adhesive as part of its structure, not the process by which the assembly was obtained.

Claim 12, and its dependent claims 14-20, 35-36, and 38, are submitted as patentable over the cited references to APA, Forray and Marrs et al.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Dated: January 28, 2004

Respectfully submitted,

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